

CLAIMS

What is claimed is:

- 5 1. An energy dense energetic material comprising:
- a layer of material comprising one or more metals substantially not in oxide
form; and
- a layer of material comprising one or more metals substantially in oxide form;
and
- 10 wherein said layers in combination are energetic and have a thickness of less
than or equal to approximately 100 nm.
2. The material of claim 1 wherein said layers have a thickness of less than or equal to
approximately 10 nm.
- 15 3. The material of claim 1 comprising a plurality of layers of material comprising one or
more metals substantially not in oxide form.
4. The material of claim 3 comprising a plurality of layers of material comprising one or
20 more metals substantially in oxide form.
5. The material of claim 4 wherein each layer of material comprising one or more metals
substantially in oxide form is adjacent to at least one layer of material comprising one or more metals
substantially not in oxide form.
- 25 6. The material of claim 1 comprising a plurality of layers of material comprising one or
more metals substantially in oxide form.

7. The material of claim 1 wherein the layer of material comprising one or more metals substantially not in oxide form comprises one or more metals selected from the group consisting of Al, Ti, Li, and Mg.

5 8. The material of claim 1 wherein the layer of material comprising one or more metals substantially in oxide form comprises one or more metals selected from the group consisting of W, P, Fe, and Mn.

9. The material of claim 1 wherein the layer of material comprising one or more metals
10 substantially not in oxide form comprises one or more compositions selected from the group consisting of metal hydrides and metals with interstitial hydrogen.

10. The material of claim 9 wherein the layer of material comprising one or more metals substantially not in oxide form comprises one or more metal hydrides.

15 11. The material of claim 9 wherein the layer of material comprising one or more metals substantially not in oxide form comprises one or more metals with interstitial hydrogen.

12. The material of claim 1 fabricated by plasma enhanced chemical vapor deposition.

20 13. The material of claim 1 adhered to a substrate selected from the group consisting of polymers, ceramics, glass, metals, and curved surfaces.

14. The material of claim 1 wherein said layers form an energetic material selected from the
25 group consisting of TNT, RDX, Tritinal, and AFX-757.

15. The material of claim 1 wherein said material forms energetic fragments upon detonation.

16. The material of claim 15 wherein said energetic fragments comprise a material selected from the group consisting of elemental Mn and elemental P.

5 17. The material of claim 1 wherein said material is useful in an anti-tamper device.

18. An energy dense energetic material comprising:

a first layer of material, comprising one or more compositions selected from the group consisting of metal hydrides and metals with interstitial hydrogen; and

10 a second layer of material, comprising one or more metals substantially in oxide form; and

wherein said layers in combination are energetic and have a thickness of less than or equal to approximately 100 nm.

15 19. The material of claim 18 wherein said first layer of material comprises one or more metal hydrides.

20 20. The material of claim 18 wherein said first layer of material comprises one or more metals with interstitial hydrogen.

21. A method of making an energy dense energetic material, the method comprising the steps of:

depositing a layer of material comprising one or more metals substantially not in oxide form; and

25 depositing an adjacent layer of material comprising one or more metals substantially in oxide form; and

wherein said layers in combination are energetic and have a thickness of less than or equal to approximately 100 nm.